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VOL. XXXIX. APRIL, 1925 No. 4

CONTENTS

ORIGINAL ARTICLES

The Treatment of Acute Pyogenic Joint Infections. Joseph A. Blake, New York 81

Technique of Jugular Bulb Drainage Following Mastoiditis. John McCoy, New York 83

Venoclysis. George A. Hendon, Louisville, Ky. 85

A New Tampon For Tonsil and Adenoid Operations. Louis M. Pearlman, New York 87

Some Remarks on Plastic Surgery. J. Eastman Sheehan, New York ... 88

The Essentials of Hospital Staff Organization. John E. Cannaday, Charleston, W. Va. 90

EDITORIALS

Two-Stage Amputation for Pyarthrosis of the Knee 91

The Blood Count and the Ice Bag in Acute Abdominal Disease 91

PROGRESS IN SURGERY

Débridement of Burns. Cleft Lip and Palate. Lugol's Solution in Goiter. Congenital Fixation of Duodenum. Cholecystogastrostomy for Gastric Ulcer. Hepatic Function Tests. 92

Pancreatic Cysts. Appendicitis and Allergy. Non-tuberculous Iliopsoas Abscess. Granuloma Inguinale. Pre-renal Anuria. 93

Catheter Drainage for Pyelitis. Torsion of Pedicle of Ovarian Cysts. Varicose Veins. Varicose Ulcer. 94

Splanchnic Anesthesia. Injuries to Carpal Bones. Fractures of Neck of Femur. Injuries to Tendons. 95

BOOK REVIEWS 95

ANESTHESIA SUPPLEMENT

President's Address—Eastern Society of Anesthetists, (1924). Frank L. Richardson, Boston, Mass. 34

Extremes of Age as Surgical and Anesthetic Ricks. E. J. Brown, Stanford, Ky. 35

Handling Goiter Risks. E. O. Rushing, Dallas, Texas 37

Caudal Anesthesia. M. Mummey, M. D., Denver, Col., and David C. Elliott, Louisville, Ky. 39

Sacral Anesthesia in Obstetrics. S. P. Oldham, Owensboro, Ky. 42

Ethylene-Oxygen Anesthesia. R. G. Henderson, Long Beach, Cal. 45

High Pressure vs. Low Pressure Nitrous Oxid-Oxygen Anesthesia. Frank W. Chandler, D.D.S., Los Angeles, Cal. 46

The Keeping of Anesthetic Records. Eleanor Seymour, Los Angeles, Cal. 47

The Pulse as a Guide to Anesthesia. Garrett Hogg, Springfield, Mo. .. 49

Two Extreme Cases of Anoxemia. Nettie Klein, Texarkana, Tex. .. 50

A Method of Anesthesia for Operations on the Head and Neck. T. Drysdale Buchanan, New York. . 50

Synergistic Analgesia. G. T. Tyler, Jr., Greenville, S. C. 51

Local Anesthesia in Abdominal Surgery, M. W. Grove, Atlanta, Ga. . 53

Recent Experiences of Anesthetics in America. Z. Mennell, M. B., London 57

EDITORIALS

Certain Responsibilities in Teaching Anesthesia 58

SOCIETY PROCEEDINGS

Spring Meetings—1925 56

BOOK REVIEWS 59

QUARTERLY INDEX 61

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THE TREATMENT OF ACUTE PYOGENIC JOINT INFECTIONS*

JOSEPH A. BLAKE, M.D., F.A.C.S.,
NEW YORK

The story of the treatment of pyogenic arthritis resembles in many ways that of suppurative peritonitis and empyema of the thorax, and I believe it will be instructive and interesting to glance back at the steps that led up to our present methods of treatment.

Not so long ago all these cavities were believed to be extremely prone to infection and, as a result of this preconceived idea, it was thought that they possessed very little power to overcome infection. This belief was kept alive by the crude and unreasonable methods of treatment thought to be necessary. Many drainage tubes were placed in the peritoneal cavity and in the joints and they were even laid open and packed with gauze,—the sole aim being to remove the exudates as fast as they were formed, without considering how much the surgeon was contributing to their formation.

The pleural cavities had their share of long drainage tubes also, but escaped much of the gauze because it was not necessary to prevent the lung from protruding as was the case in regard to the intestines when large wounds of the abdominal wall were left open; nor could the thorax be laid wide open as could a joint. We saw light first in the treatment of peritonitis and years ago discarded gauze and multiple drains as injurious and provocative of continued inflammation. Why it took so long to apply this knowledge to the treatment of joints it is difficult to say. The main reason was probably our adherence to precepts and principles that we had accepted without reasoning. We now know that the same principles apply to the treatment of all cavities. These principles are, in the main:

First. If the origin or cause of infection is removed before pathological changes have taken place in the deeper tissues, resolution usually follows.

Second. Traumatism leading to death of tissue prolongs suppuration and prevents resolution.

Third. Foreign bodies, such as drains, produce traumatism.

Fourth. Accumulation of the products of infection, not only delay absorption, on account of their bulk but by pressure in the rigidly enclosed cavities, such as the joints, interfere with circulation and may cause thrombosis of vessels and necrosis of tissue, not to speak of toxins from the exudates.

The best illustration of the application of these principles occurs in the treatment of a case of spreading peritonitis caused by a gangrenous appendicitis. If in such a case the appendix is removed before the subserous tissues of the peritoneum become involved to the point of necrosis, resolution takes place rapidly. But if the tissues are roughly handled so as to produce necrosis, or if drains are introduced, suppurative peritonitis continues.

When we consider the pleura and synovial membrane the illustration is not so clear but it nevertheless applies. When causes of infection, such as contaminated wounds, are properly excised (pared out) before infection has become established in the subserous tissues, resolution occurs, but not if drains are inserted. In the case of the pleurae and joints when causes such as pneumonitis and infections of bone cannot be removed, the infection of the membranes is bound to be kept up and the treatment perforce changes. In such circumstances we must give vent to the products of infection but we should do so by free incisions, and insert drains only to the region involved and not through the region.

When suppuration of a joint is produced by extension from a focus in a bone or from an infected fracture implicating the joint, it is obvious that the primary lesion in the bone must be well laid open and drained so as to prevent, so far as possible, contamination of the joint. Such joints should be kept at rest in order to prevent spreading the infection throughout the articulation. Keeping the joint at rest may appear contrary to the practice of Willems, but in his cases of gunshot wounds the wounds had all been pared out and there were no serious lesions of bone. When there is a serious lesion of an adjacent bone and the joint is continuously infected from it the outlook is bad nearly always for the joint, and frequently for the life of the patient. In the case of the knee the situation is formidable and amputation should not be deferred to the point of danger to life. When it was necessary to amputate for suppuration of the knee joint, I have found that it should be done in two stages: the first consisting of an amputation through the joint, which means merely cutting through the soft

*Read at a meeting of the Clinical Society of the Hospital for Joint Diseases, New York, February, 1925.

tissues; the second, of a formal amputation at the lower third of the thigh after the infection had subsided. In this way the danger of osteomyelitis of the stump is avoided.

Many of the infections of the joints are through the blood stream and it would almost seem that the infection occurred directly in the synovialis itself, although it is more probable that the first locus is a small embolism or thrombosis of its minute blood-vessels. These cases form a class by themselves but resemble closely, from the standpoint of treatment, many cases of empyema of the pleura. In both instances, if opened and drained in the early stages, the outcome is often bad, but if treated by what has been termed the closed method in the treatment of empyema the results are far better. By the closed method is meant repeated aspiration, and while in the case of the pleural cavity drainage as a rule has to be resorted to later, resolution is frequently obtained in suppuration of the joints.

In regard to the actual details of treatment let us first consider that of suppurative arthritis caused by direct infection. These cases may be subdivided into two groups: one caused by contaminated wounds, the other by extensions of osteitis. The first group comprises by far the greater number of cases and necessarily a considerable variation in the conditions present, depending upon the nature and extent of the injury. The variety or species of the infecting organism also influences treatment but no more so than in any case of arthritis and, therefore, will be referred to later. It is practically impossible to review in a short paper all the variations in wounds of different joints and the corresponding indications for treatment, so only generalities will be stated. In the first place in any contaminated wound, whether involving the bones, joints or soft parts there is a period of up to twelve hours following the injury in which there is practically no pullulation of bacteria and a thorough trimming away of contaminated and devitalised tissues will prevent infection, or, if not entirely successful, will at least modify the virulence of infection. Success naturally depends largely upon the thoroughness and skill of the surgeon. Joints treated in this way should be partially closed, leaving them open in places so that wound secretion may escape, but no drains should be used. If mobility of the joint is desirable, as is the case in most of the joints of the upper extremity, early active motions should be instituted and the dressings should be changed frequently so as to avoid gumming and retention of blood and secretions. If, on the other hand, mobility is not desirable, as for instance when so much of the bony structures of the knee has been removed as to result in instability, the joint should be kept at rest in the position of election for an ankylosed joint. In these preliminary operations before infection has become established, cancellous bone that is contaminated and crushed, should be removed, as for example, a crushed astragalus, the indications for the extent of excision or resection depending upon the structure and function of the joint.

After infection has become established as a result of wounds, the treatment depends upon the nature of the injury. If the wound is of the soft parts and the opening into the joints is small and if there is no reason to believe there is any necrotic tissue in the joint, the wound should be laid open but not the joint, at least in the early stages, and the joint may be aspirated as in the case of the metastatic infections to be considered later. If, on the other hand, the wound communication to the joint is large and is not draining freely, other incisions should be made as indicated but no drains into the joint should be used and active motions may be carried out.

When the infection of the joint is part of an infection involving injury of bones, such as fractures entering into the joint, obviously the infected bony tissues must be adequately drained even to the point of excision when that is possible. As the infection of the joint is dependent upon and prolonged usually by the infection of the bone the joint should be effectually drained but drains should not be passed through it. As it may be possible to keep the suppurative process confined to the region of bony injury such joints, should, as a rule, be kept at rest, as has been already stated.

The second group of directly infected joints, namely, those caused by extension of an osteomyelitis or epiphyseal abscess, are fortunately uncommon. The treatment is obvious and has been referred to. The suppurative process in the bone must be laid freely open and the joint kept at rest. There may be an early stage in which the joint is inflamed rather than infected and it should be treated by aspiration until one is positive that this treatment will not succeed. This failing, drainage and, not infrequently, amputation, must be resorted to.

The treatment of the large class of joints infected through the blood stream, the metastatic infections, has already been indicated; and it remains only to enlarge somewhat upon the details. Aspiration should be performed as soon as fluid can be easily removed in order to avoid overdistension which not only causes pain but may lead to disorganization. The character of the fluid should be noted and particularly changes in character. It should be cultured to determine the nature of the infecting organism. Smears should be taken for comparison. Aspiration should be repeated as often as may be necessary to prevent overdistension and it should be continued until resolution occurs or one becomes convinced

that destruction of tissue, such as cartilage, has taken place, when incision and drainage become necessary. The advent of necrosis is determined by the exudate becoming more purulent, by increasing bogginess (edema) about the joint, increasing sensitiveness and *x*-ray findings. Drains, when necessary, should pass through the overlying tissues and may be stitched to the capsule so as just to enter the joint. It always must be borne in mind that there will be tissue necrosis and prolonged infection about each drain.

The question of active motion of joints during the period of aspiration and during that of drainage is a rather delicate one. My opinion is that it depends chiefly upon the amount of damage that may ensue. Consequently, I prefer to suspend the limb and employ enough traction to prevent pressure on the articular cartilages. The weight of the limb is sufficient in the case of the upper extremity. A few pounds suffices for the lower extremity. Suspension can be arranged so that active motions are possible, and access to the parts for dressings and the increased comfort of the patient make it desirable.

In regard to the lavage of the joint cavities, my impression is that normal saline solution is as good as any antiseptic. Ordinarily lavage is not indicated when drainage is free. When there is retention of pus and particularly necrotic material it is of distinct value. When a joint is being treated by aspiration I believe that throwing in a syringeful or two of saline solution after the exudate has been removed and withdrawing it through the same needle is of value if the exudate is thick. I also believe that specific sera should be employed when possible by introducing them after the exudates have been aspirated.

In regard to the bearing of the variety of infecting organisms upon the question of treatment, the staphylococci, and particularly staphylococcus aureus, are more apt to produce necrosis and destruction of a joint than are the streptococci; they are also more persistent and consequently aspiration alone is not so successful as in infections with the latter. I have observed resolution after over twenty aspirations in streptococcus infections. Consequently staphylococcus arthritis comes more often to open drainage. Mixed infections are always more serious than infections with a single organism. This is one reason why some of the milder specific arthritides, such as gonococcus, should not be drained. I have never seen a case of gonococcus arthritis that did not recover with aspiration and serum therapy but I have in mind a case of gonococcus arthritis of the knee which was drained and in which disarticulation at the hip eventually became necessary.

TECHNIQUE OF JUGULAR BULB DRAINAGE FOLLOWING MASTOIDITIS

JOHN McCOY, M. D.
NEW YORK

Drainage of the jugular bulb is sometimes imperative, when we are confronted with a condition of suppuration in the bulb following a mastoiditis and sinus thrombosis.

In approaching this surgical problem there are several important factors to be remembered:

1. The position of the bulb. It is deeply situated in the neck, directly under the floor of the middle ear and in close juxtaposition to the facial nerve posteriorly and inferiorly.

2. The size of the bulb. In more than fifty percent. of cases the bulb is very deficient or even absent on the left side.

3. The contents of the bulb. Besides the upper end of the jugular vein, it contains three large and important nerves which pass through it, the pneumogastric, the glossopharyngeal, and the spinal accessory. The spinal accessory being situated laterally is most likely to be injured by manipulation when we reach the bulb.

Keeping these points in mind, there have been several methods advocated, each of which accomplishes the desired result with a varying amount of difficulty as a surgical procedure, and with a varying degree of safety to the surrounding structures, especially the facial nerve.

The simplest of these is the skin fistula method of Alexander in which the margin of the resected jugular vein is stitched to the surrounding wound, and in this way a direct path of drainage is established from the bulb.

Another method, devised by Piffl, is as follows: After separating the membranous canal wall as we do in the radical mastoid operation, and pushing aside all tissues up to the Glaserian fissure, we remove the floor and part of the anterior wall of the bony external canal to the hypotympanum. Having gotten this far the upper portion of the internal jugular vein makes its appearance.

Voss' method: After exposing the sinus and removing the bone over it the lower part of the vein becomes more and more horizontal, the lateral wall of the sinus becoming the inferior. The lower wall of the sinus is followed by removing bone with gouges. By following the course of the vein with a probe, the distance of the anterior wall of the jugular fossa can be determined. Exposure of the bulb is accomplished by very cautiously removing the bony wall above the anterior boundary of the jugular fossa. (To avoid injury of the horizontal semicircular canal the bone is not removed higher than one-half centimeter.) The posterior membranous wall of the bulb is readily exposed in most cases where

we have to deal with a well-defined bulb. After the posterior wall has been removed up to the roof of the bulb, it some times becomes necessary to remove the edge of bone which marks the separation of the sinus proper and the bulb. This shows the sharp knee from where the lateral wall of the sinus goes into the posterior wall of the bulb.

Whiting's method: By using the posterior semicircular canal as a guide, all the diploic bone immediately below it is removed, and in so doing the posterior aspect of the bulb itself frequently comes into view. Now taking as a guide the point of utmost curvature of the sinus posteriorly, he removes in a direction downward and inward the occipital groove and the jugular process of the occipital bone to a level which he considers is the lowest part of the sinus. He then removes the bone covering the bulb and knocks off the knuckle of the foramen lacerum posterior. This gives a splendid exposure of the bulb, and through this a catheter may be passed down through the portion of the jugular vein remaining in the neck.

Another method is that of Grunert's, otherwise known as the "gutter" operation, which is as follows: First a complete resection of the tip of the mastoid. Then separation of the three muscles from the base of the skull, namely, the sternomastoid, digastric and splenius capitis. The soft parts are retracted as we work toward the base of the skull in a horizontal direction, in order to reach the jugular vein. The operative field is sometimes considerably narrowed by a prominent transverse process of the atlas. This may have to be resected, and in doing so one must be careful not to injure the vertebral artery. The rectus capitis lateralis is now pushed aside in order to remove the last bridge of bone between the free margin and the jugular foramen. The bulb is now split open from the sinus end. This concludes the methods of attacks by way of the mastoid.

There is another method of approach by way of the neck devised by Tandler. The mastoid incision and the incision for the jugular are converted into one. The sternomastoid muscle is separated for its entire length, and pushed posteriorly. We now search for the spinal accessory nerve. It is tied loosely with a suture, so that it may be in good view during the operation. We follow the course of this nerve to its exit at the jugular foramen. The finger is now passed deeply into the wound, and we find the space between the styloid process and the mastoid process. Here the exit of the facial nerve through the stylomastoid foramen may be exposed. The digastric muscle is separated from the digastric fossa and pushed forward and downward. If we work on a line below the stylomastoid foramen and this muscle, there will be no danger of injuring the facial nerve. After pushing aside the digastric muscle the occipital artery may be ligated in two places and cut out. The jugular vein may now be separated from the margin of the jugular foramen, which can be felt with the finger. Now loosen the uppermost portion of the vein after pushing aside the periosteum at the base of the skull, and the rectus capitis lateralis. The bone is now removed from the sigmoid sinus to the bony margin of the jugular foramen, and the sinus, bulb and vein are split wide open.

I believe that the most complete and well defined of the operations that approach the bulb from the mastoid cavity is Whiting's. This operation, however, is not possible in all cases, especially those where the mastoid process is short and deep, or where the sinus is far forward. I also believe that the operative approach by way of dissection in the neck is applicable in all cases, and gives the maximum of safety to the facial nerve.

Before resorting to the above described radical procedures I believe in the following sequence: First, primary ligation of the internal jugular vein. Then should pus appear from the bulb later on, I proceed to a jugular resection, and through the upper cut end of the vein, irrigation and drainage of the bulb. If this proves inadequate, incomplete or impossible, then I proceed as described above.

730 FIFTH AVENUE.

HEMORRHAGIC MASTOIDITIS.

Of what avail is it to repeatedly incise a drumhead to evacuate pus and to attempt to prevent an operation on the mastoid process in the type of case whose clinical history, bacterial flora and general aspect are such that we are reasonably certain that it falls within the group-type termed "hemorrhagic mastoiditis?" In this type, the bony framework of the mastoid is not broken down, and macroscopically it is not affected. The bloodvessels are greatly dilated, the mucosa red and swollen, and a little serum and thin pus may be found scattered through the mastoid cells. The infection is not walled off, as in the coalescent type, but the dilated bloodvessels rapidly carry the infecting organisms throughout the mastoid and, unless the process is promptly and completely checked, even further, into the sinus, meninges and brain. This form has been rightly called the dangerous form of mastoiditis; and its prompt recognition is imperative for the preservation of the patient's life.

Yet, strange as it may seem, it is this form which is most frequently overlooked by the attending physician.— S. J. KOPETZKY and A. A. SCHWARTZ in *Archives of Pediatrics.*

VENOCLYSIS*

George A. Hendon, M.D., F.A.C.S.
Louisville, Ky.

I feel very apologetic for using a word, as the title of my paper, that has not received the stamp of approval or been authorized by custom. But in searching for a name that was descriptive and euphonious to apply to this somewhat rare therapeutic measure, I fell upon the term venoclysis by analogy. We have proctoclysis, hypodermoclysis, and why not venoclysis? I therefore submit the word for rejection or approval as its merits may indicate, and pass on to a consideration of the process involved.

The fact is universally recognized that toxins result in the dehydration of tissue, so does serious loss of blood and starvation. It is easy to imagine the distress of each individual cell as the miniature lake in which it lives proceeds to "dry up." An exaggerated parallel can be drawn by one who has witnessed the sudden draining or the gradual "drying up" of a fish pond and observed the despairing efforts and desperate struggles of the inhabitants thus bereft of their medium of existence. It is also a matter of common knowledge that we possess but four principles upon which toxins can be combatted:

(1) By increasing the vital resistance;
(2) By elimination of the poison;
(3) By antidoting the poison;
(4) By diluting the poison.

Our chief interest is concerned in the first and last of these principles: raising vital resistance by supplying the depleted fluid with nutrient media, and diluting the toxin by infusing the system. For meeting these indications the *via naturalis* is totally inadequate by reason of impaired retaining and absorbing faculties of the gastro-intestinal mucous membrane. This applies less forcibly to the large than to the small intestine.

Recognizing the vast importance of introducing an abundance of fluid into the system in various physical crises, persistent efforts have been made to find ports of entry that would serve the purpose in view. The main adaptations have been protoclysis, hypodermoclysis, intermittent intravenous infusion. It is neither profitable nor fair to emphasize by recitation the objects and difficulties found in connection with attempts to utilize the means just referred to. I shall pass directly, therefore, to a method that I have employed in two cases with results that were so remarkably successful that I am encouraged to submit for your consideration.

In May, 1924, I first employed the method, and again in June, 1924, as a result of an article by Rudolph Matas read before the American Surgical Association in June, 1923. In May, 1924, Matas' article appeared in *Annals of Surgery;* but more or less condensed extracts had winged their way through the current literature of the intervening period, and when the case of Mrs. B. presented, May, 12, 1924, I was impressed by the apparent value of the method, and was inspired by the weight of authority to give it the test of application.

The patient (Mrs. B.) was operated upon for gross infection of the generative organs. Her pelvis disclosed a scene depicting a battlefield upon which the opposing forces of microbic invasion and the organs of reproduction had waged a relentless conflict. Her perineum and cervix were extensively and distressingly lacerated. These were sutured into a semblance of their pristine symmetry. The uterus was large, soft and succulent, flanked on either side, and engaged in the rear, by tubo-ovarian abscesses of unusual size. The ordinary procedures to remedy this evil were adopted and for seven days progress was satisfactory. Then suddenly a very alarming hemorrhage from the uterus appeared. I was never able to discover whether it came from the endometrium or from the cervix. At any rate it was copious and depressing. The patient manifested all the signs of sudden depletion. She became cold and clammy with profound exhaustion. Her pulse was indistinguishable at the wrist and her temperature went below normal. Emergency measures were adopted. The vagina was packed with gauze, an intravenous saline infusion was administered, and the instillation of a 5% glucose solution at the rate of 40 drops per minute was begun and continued over a period of 48 hours. At the end of that time the needle that had served as a cannula became dislodged and her condition was so much improved it did not seem necessary to continue the treatment. She made a good recovery though there was considerable sloughing of the abdominal wall. No record was kept in this case of the total amount of fluid employed.

On June 2, 1924, I operated upon a patient for advanced intestinal obstruction due to strangulation by sero-fibrinous bands. The intestine was gangrenous and about sixteen inches was resected. The patient suffered profound shock and his life was despaired of, so I determined to use the intravenous drip. In the meantime I had devised a cannula with openings in the sides and containing a shoulder so it could be tied in the vein. The drip was started in the median basilic vein and continued without interruption eight days and nights (192 hours) during which time twelve quarts of 5% glucose solution were given. This patient's life was saved by the procedure beyond any doubt. I make this positive statement because I have never before seen a patient in a similar condition survive.

Our apparatus consisted of a Thermos bottle, Murphy dropper, and the cannula above described. The fluid was started from the bottle at a temperature of 120° F., and we found by using heavy stethoscopic tubing it could be passed beneath the patient's body without compression and the heat thereby maintained and the fluid delivered into the vein at approximately 100° F.

Friedemann has been employing this method of infusion for seven years, and his experience in several hundreds of cases has proved extremely satisfactory. He generally uses a 0.9 per cent. solution of sodium chloride or Ringer's solution, adding epinephrin, glucose or digitalis as may be indicated. A sign that the patient is beginning to get too much fluid is an increased lacrimal excretion or slight edema of the eyelids. On account of the danger of hypostatic pneumonia he is careful not to infuse too much fluid when there seems to be a predisposition to this. He has never had any case of embolism with the drop infusion. With menacing hemorrhage the drop method replaces the loss of blood without abruptly raising the blood pressure. A further spe-

*Read before the Southern Surgical Association, 1924.

cial advantage is with exhaustion of all kinds, dehydration of tissues, and as a preliminary measure to operations on the enfeebled. Since he has been relying on drop infusion he has much widened the limits of operability, patients coming to the table with a fine pulse when other surgeons had declined to operate on account of the weak or almost imperceptible pulse before. In severe general infections the combination of drop infusion with venesection has rendered valuable service, as also drop infusion with camphor or epinephrin, with or without venesection, in collapse in pneumonia. Friedemann cites typical instances of all these conditions to illustrate the benefits from the drop infusion, as also in the severe headache after intraspinal anesthesia, and in two patients moribund from kidney disease.

For the continuous infusion Penfield and Teplitzky recommend physiological salt solution or less than 10% glucose solution. These should be prepared daily with freshly distilled water and should be used within twenty-four hours. Great care should be taken in the sterilization of all apparatus and utensils employed, as well as of the solution, in order that there may be no reaction. The tubing must be carefully handled as it is one of the most frequent causes of reaction. Three factors in the reaction are: (1) the temperature of the infusion fluid, (2) the hydrogen-ion concentration of the solution, and (3) the introduction of a foreign substance into the blood. A number of experiments have shown, however, that the temperature and hydrogen-ion concentration of the infusion solution may vary considerably without ill effect. These authors state that the infusion may be given from two to four hours without tiring the patient. In their cases the rate of flow was from 800 to 1,500 c.cm. per hour. As much as 4,500 c.cm. has been given by this method in three or four hours. The venous pressure is considered the best index of the patient's condition and the effects of the infusion. A rising pressure is a sign of unfavorable reaction. The venous pressure is determined at the beginning of the infusion, at the end of the first and second half hours, and then every hour as long as the infusion is continued. In the majority of cases it remains practically unchanged, but in shock it occasionally falls.

According to Unger and Heuss continuous intravenous infusion, as recommended by Friedemann and Leowen, was tried as a last resort in eighty-two cases, those of children and adults. Eighteen of the patients lived. The quantity of liquid given in twenty-four hours varied from three to eleven liters. The infusion was usually continued for two or three days, but in especially grave cases was given for four or five days. The technique was the ordinary one. After venesection a blunt cannula was tied into the ulnar vein and the arm placed on a straight splint. The fluid was given at the rate of from sixty to one hundred drops a minute. Special warming apparatus was dispensed with since it could be safely left to the body to raise these few drops a minute to body temperature. The main indications, according to these authors, are grave collapse, extensive burns, and marked dehydration (typhoid, dysentery, cholera). When the hemoglobin is low, and in cases of arteriosclerosis, care is necessary with regard to the quantity given. Undesired sequelae were edema, hypostatic pneumonia and thrombosis of the arm vein. The last-mentioned never caused any further complication.

Woodyatt, Sansum and Wilder state that a normal rabbit, dog or man can utilize between 0.8 and 0.9 gram of d-glucose per kilogram of body weight an hour of time without glucosuria for an indefinite period; that is, d-glucose in 10% to 50% solution can be introduced directly into the vein at rates corresponding closely to 0.85 gram of glucose per kilogram of body weight an hour of time for from six to twelve hours and not produce any glucosuria. Such rates of glucose administration do not cause any effect that can be interpreted as diuresis.

These facts force certain conclusions, some of which may be mentioned: A man weighing 70 kg., when resting quietly in bed, may receive and utilize 63 gm. of glucose by vein per hour without glucosuria. He then receives four times 63, or 252 calories per hour, a rate corresponding to 6,048 calories per day. If his resting requirement is 3,000 calories per day, he could thus receive double what he needed, or enough to cover the caloric expenditure of the same man during heavy physical exertion. Intravenous nutrition with glucose is thus proved to be a feasible clinical proposition.

A man of 70 kilogram weight may receive and utilize 63 gm. of glucose by vein per hour without glucosuria. Resting requirements are 3,000 calories per day. As one gram of glucose yields 3¾ calories, 800 grams of glucose per day would meet resting requirements, or not less than a liter and a half or more than two liters of a 5% solution of glucose intravenously. Sixty drops of the solution per minute would aggregate 3½ pints in twenty-four hours, which constitutes the amount required.

We feel that the conclusion is justified that the intravenous method of introducing fluids and nutriment during the period of grave physical crisis, when the powers of absorption and assimilation are practically abolished or suspended, is practical. The procedure is safe, simple, accurate, and prompt in its effects. Up to the present no untoward accidents have been reported in connection with its use. The physiological indications for its employment are numerous and quite obvious, and there is ample ground to expect its universal application.

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A NEW TAMPON FOR TONSIL AND ADENOID OPERATIONS

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New York

One of the most important accessories in a tonsil and adenoid operation is a proper tampon. In general surgery gauze in the form of a pad or roll is used both as a sponge, to keep the operative field clear, and as a tampon, to induce hemostasis. In throat operations, however, the pharynx is effectively kept clear by the use of a suction apparatus. The gauze sponge is therefore entirely unnecessary in the present day tonsil and adenoid operation. In fact, hemostasis action by a tampon of non-absorbent material is accomplished sooner than by one of a material as highly absorbent as gauze. Because of the nature of cotton fiber, the gauze sponge absorbs a certain amount of blood, and only after it is more or less saturated does it act well as a hemostat. It is

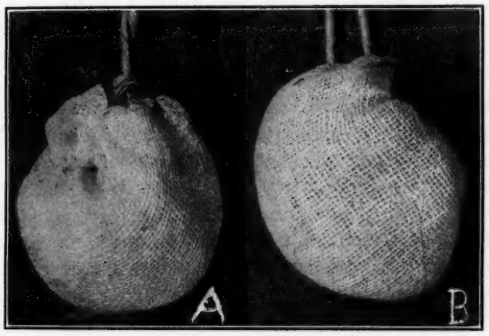

Figure 1. A—gauze sponge. B—lamb's wool tampon.

obvious therefore that the function of the gauze as a sponge is here a positive disadvantage as a tampon.

To be effective the tampon must remain in direct contact with the denuded surface of the nasopharynx and of the tonsillar fossae until hemostasis is complete. The gauze sponge on becoming moist, loses all resiliency, becomes lumpy, and shrinks to an inadequate size. (Compare figures 1A and 3A). The sponge falls away from parts of the denuded tissues and its effectiveness for hemostasis is proportionately decreased.

A further objection to the gauze sponge is its comparatively slight compressibility. A sponge that is large enough to fill the nasopharynx cannot be compressed in the holder to a size sufficiently small to slip easily behind the soft palate. Any undue pressure on the free border o fthe soft palate after the tonsils have been removed will tear one or the other of the posterior pillars at their point of juncture with the soft palate. A large irregularity in the contour of one of the palatine arches, which is frequently seen after a tonsil and adenoid operation is the result of such a tear, and is caused by the crowding of a gauze sponge into the nasopharynx. This same objection to the gauze sponge, although to a lesser degree, applies also to its use in the tonsillar fossa. After a large imbedded tonsil has been removed the fossa will be found to be considerably larger than the space between the two pillars, and the crowding of a dry gauze sponge into such a fossa will be responsible for more or less trauma.

A tampon that would meet the specific requirements of a tonsil and adenoid operation would be one that is soft, velvety and fluffy; highly compressible so that it may be easily inserted into the fossae; of such resilience as to spring back and conform to the contour of the nasopharynx and the tonsillar fossa; of a material so non-absorbent and non-shrinkable that it will retain its size and shape and remain in contact with all of the denuded surface until hemostasis is complete.

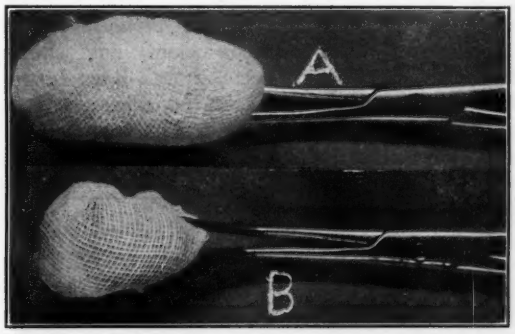

Figure 2. A—gauze sponge compressed in sponge holder. B—lamb's wool tampon compressed in sponge holder.

After repeated experiments a ball of lamb's wool wrapped once in gauze was tied. This tampon has subsequently proved its complete adequacy. It is made by wrapping a ball of prepared wool of the desired size in one layer of gauze. The free ends of the gauze are stitched with a string, leaving a loop of string of sufficient length to facilitate the withdrawal of the tampon from the fossae. It is rendered aseptic in the usual manner.

In brief, the advantages of the lamb's wool tampon are:

Texture. Since the texture of the lamb's wool tampon is soft and velvety its contact with the denuded tissues is without trauma.

Compressibility. A lamb's wool tampon is approximately four times as compressible as a gauze sponge. (Compare A and B, figure 2). A tampon that is large enough to fill entirely the nasopharynx or the tonsillar fossa can be compressed in the sponge holder to a size small enough to slip easily into the nasopharynx and into the tonsillar fossa, eliminating the possibility of injury to the pillars.

Resilience. Being resilient and flexible, the

lamb's wool tampon on being released from the sponge holder completely fills the nasopharynx and the tonsillar fossa. It remains in contact with the denuded tissues and produces effective hemostasis.

Absorptiveness. As the tampon is non-absorbent it acts as a hemostat immediately upon being placed in contact with the tissues.

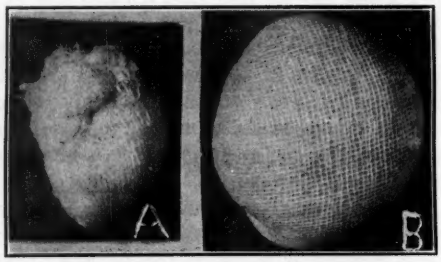

Figure 3. A—gauze sponge after saturation and compression showing lumpiness and no resiliency.
B—lamb's wool tampon after saturation and compression, showing resiliency and return to original size.

Shrinkage. This tampon does not shrink on becoming moist. (See fig. 3, B). It retains its full size until its action as a hemostatic is complete. This obviates the crowding of an oversized sponge into the fossae. It eliminates also the

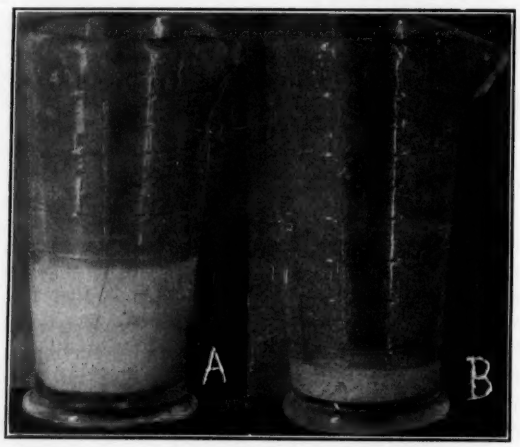

Figure 4. A—Sponge. Amount of fluid expressed after saturation. Showing high degree of absorptiveness.
B—Tampon. Amount of fluid expressed after saturation. Showing slight degree of absorptiveness.

necessity of replacing a shrunken sponge or of inserting an additional sponge to completely cover the denuded surface.

Other Advantages. When it is desired to leave the tampon in the fossae for any length of time, the lamb's wool tampon can be allowed to remain comparatively longer without adhering to the tissues.

Because of its compressibility and resilience a uniform size of tampon can be used irrespective of the size of the nasopharynx or the tonsillar fossa.

CONCLUSION

The gauze sponge that is used in practically all tonsil and adenoid operations is manifestly inadequate for the requirements of this operation. Its function as a sponge is unnecessary and undesirable. It is decidedly unsatisfactory as a tampon, and causes more or less trauma. The lamb's wool tampon, on the other hand, effectively meets all the requirements. Because of its softness and flexibility it can be manipulated in the fossae without causing any trauma. Being non-absorptive, resilient and non-shrinkable it is an effective tampon for hemostasis. In a series of over one thousand cases in which this tampon was used the advantages enumerated above were conclusively demonstrated. This new tampon greatly facilitates the tonsil and adenoid operation.

1 WEST 86TH STREET

SOME REMARKS ON PLASTIC SURGERY*

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Rapid advances have been made in organizing the work of plastic surgery in America; and the profession in general is deeply concerned in this progress. Not every doctor will undertake plastic surery, but it must be of importance to every physician to know that facilities now exist in many sections of the country for affording the relief that only plastic surgery can give.

What is new in the matter is the wide extension of organized carefully directed effort under definite leadership. There is a growing list of hospitals that maintain regular clinics in plastic surgery, and, what is even more important, there is organized specialized effort under highly competent direction, in many of our great teaching centers. Kazanjian at Harvard, Ivy at Pennsylvania, Davis at Johns Hopkins, Smith at Grand Rapids, Blair in St. Louis, and New at the Mayo Institute, to name but a few of the leaders, have been enabled to devote themselves intensively to the work of organizing, standardizing and teaching. The men in the hospital clinics are doing their share in the same sense, for their work is under continuous observation by visiting doctors, whose interest and encouragement, in point of fact, provide a stimulus of the highest importance.

It is the commonplace experience of every doctor to be consulted about burns that disfigure the face, the neck, or areas less exposed. Hitherto there have not been the facilities for dealing with such cases. Now these facilities exist. It is not even necessary to let the burns heal or to allow the cicatrices to form. The process of repair can be started as it should be,

*Read before the Bellevue Hospital Alumni Association, December, 1924.

immediately after the injury has been received. There is the equipment for doing it, and there are surgeons available who are trained in the technic of transferring the skin from healthy areas to those that have suffered the injury. It is right to add that there are still many surgeons who are either unaware of what results have been achieved in this field or who are frankly incredulous. It is for us to convince them, and there is nothing so conclusive as demonstration. That is another reason why the activity shown, in these widely separated centers, in the development of this specialty in surgery, is of the highest interest to the profession generally. It needs to be realized that from an undertaking so delicate as the repair of an eyelid, or even its entire replacement, to the re-covering of skin areas which immobilize the muscles of the face, neck, arms, and chest, there is no demand that cannot be met. As yet, this is not generally realized by the profession, especially by those members of it who have not the advantage of observing what is being done in the hospitals.

Similarly, the number of unattended cases of cleft palate and of hare-lip can be adequately accounted for only by the circumstance that facilities for treatment such as now exists were not available in the past. It is no reproach to anybody if general recognition of the new developments has not been as rapid as the development itself.

The impetus to all this came from the war, which compelled recourse to exceptional measures. Naturally enough, therefore, there is a tendency to regard all these plastic procedures as exceptional. But this view is wrong. What the new clinics have revealed is that in ordinary civil life there is continuous production of great numbers of cases calling for this order of treatment. By way of emphasizing this truth, let me say that if the cases that present themselves at the N. Y. Post-Graduate Hospital Clinic were to get the attention they call for, there are enough of them in a single year to keep ten plastic surgeons busy the rest of their lives.

We do not claim to have made any discovery. The work done by isolated pioneer surgeons before the war had provided the body of knowledge upon which our methods are based. All that is new is that what formerly was passive has now become very active; what formerly was the specialty of a very few, and an inviting field of research for individuals, has now become diffused, organized, standardized.

In regard to procedures for facial repair, there are some general observations to be made. First, any patient is entitled to respectful consideration of his desire for improvement of his facial appearance. We shall adhere to our professional standards in considering the motives of applicants, but we may be mindful of the fact that in the modern world it is vitally true that one's face is his fortune. Rather, it is often very palpably his misfortune, and against this he is entitled to remedy. A man may be able to breathe through his nostrils, and still have a sound moral claim for a reshifting of the distorted bones, cartilages and tissues of his nose. What is urgent is that the conduct of such remedial measures shall be in the hands of a qualified surgeon, and removed from the charge of those who know nothing of, and have no reverence for, the tissues of the human body.

Second, we must be careful to follow sound principles ourselves, to seek earnestly for the best there is in practice, and to be guided by what is evolved from the experience of many. For example, it cannot be held against a family physician if he is sceptical about the success of operations for the improvement of typical syphilitic disfigurements of the nose, for such attempts in the past too often failed. On the other hand, it has been established that most of these failures were traceable to non-recognition of the necessity for a lining as well as a cover and a support. Now we know that if a new nose will not live without a lining it will live with one, and that knowledge changes the whole outlook. So with the materials used in cosmetic repair. There was a time when paraffin injection was a method used with confidence; now we have a steady procession of victims seeking relief from paraffinoma. Gold and silver were tried as supports of the nose, but the tissues expelled them. Having learned that the tissues are inexorably inhospitable to foreign bodies, there was nothing for it but to seek the material which is at once serviceable, welcome, and endowed with the capacity to live. Cartilage, and only cartilage, I am deeply convinced, meets these requirements.

Indeed, the whole system of plastic surgery rests upon the principle that the body is a storehouse of living materials for the repair of its own deficiencies. We see whole areas of epithelium built up from tiny Reverdin grafts. A Thiersch graft will replace a mucus membrane. Cancer excisions can now be made that would not formerly be attempted because of the resulting defect. At the recent Clinical Congress of Surgeons in New York I showed a functioning face from which, in the presence of some of the same witnesses, an angioma covering all one side of the face had been removed. Where healthy skin can be so readily transported, there is no longer any need for disfiguring blemishes to be carried through life.

We even begin to see that a development of the near future in surgery will be the wide application of the same principal to the repair of defective parts, or the building up of missing features, in surgical areas other than those of the surface. Experience with plastic surgery is revealing to the surgeons reserves practically untapped.

In addition to the advantage to be derived from

consultation and comparison between the various centers in America, there will be a focus of still other lines of effort in the International Clinic established in Paris. But the greatest stimulus of all will come from the general medical profession when its members realize what is being done. It is from those who will never specialize, but who are the advisers of those who suffer, that those who devote themselves to this special branch of surgery will derive their stimulation and encouragement.

THE ESSENTIALS OF HOSPITAL STAFF ORGANIZATION*

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CHARLESTON, W. VA.

The ideal of a well balanced and competent staff is obviously that it should be suited to the needs of modern group diagnosis and treatment. Furthermore it is obviously important that the personnel of this staff shall be willing to keep a careful record of its observations in regard to the patients seen. The staff idea is a gradual evolution and divergence from the old time one-man hospital.

In my opinion the prime essential for an effective staff organization is the full cooperation of every individual member and staff unit with the others. Staff members should be selected with especial reference to their particular fitness for the work in hand; some otherwise excellent men are totally unable to fit into an organization, perhaps at times from an overdose of individualism in their make-up. Such a man is ofttimes unable or unwilling to have his talents directed in the channel necessary for a harmonious functioning of the staff machine.

Naturally, men must be selected who can be relied upon at all times to perform intelligently and efficiently their part in the day's work. The prospective staff members must have ideals, an ideal being quite necessary as a goal to live up to and to work forward to. One is reminded of the old saying about hitching your wagon to a star.

Initiative and inventiveness are necessary to the achievement of all progress. Without the first, there will be stagnation and without the second, the best use will not be made of the circumstances and means and materials at hand.

The hospital staff that is most effective is one that has been gradually evolved by a process of natural selection. The haphazard, polyglot, over-night organization of more or less incongruous elements sometimes seen, cannot be otherwise than a melting pot of incompatible and divergent elements, each of which by the process of natural mixing and selection will gradually find its own level. Proper training is often lacking. In small communities more particularly, one sometimes sees the end-results of poorly trained physicians attempting hospital work to the infinite detriment of the patient and of the best interests of the medical profession at large.

It is ordinarily assumed best that the executive authority of a hospital be vested in as few hands as possible; what is everybody's business is nobody's business. The responsibility in each department should be fixed definitely. We are of the opinion that the professional man can best see and understand the needs of a hospital and we believe that the layman does not so often make the best hospital executive.

The hospital conference is productive of good in many lines. It puts each member on his mettle, stimulates study and interest in professional work, and results in higher standards; the staff conference usually is and always should be a true post-graduate school of instruction. The man who does poor work is on the defensive and has at least to assume the onus of an explanation for his poor results, failures, and fatalities. Surgical judgment as well as technic is developed. If the conference should degenerate into a mutual admiration society, it will have significantly failed in its purpose. It should be a place for frank, free, fearless and wholesome discussion. If the patient has failed to make improvement, or if a poor result has been obtained, or if the patient has died, naturally the physician in charge should explain why and someone may do him the favor of pointing out just how the said failure or fatality could or might have been prevented.

While we believe that the particular work of the hospital should always have first consideration, the staff members should be on the watch-out for new developments along the line of their particular specialities and should bring new and interesting developments to the conference for discussion. In regard to the obscure or disputed diagnosis, the conference is of very great value. The evidence in the case is presented, the arguments pro and con are made, the case is tried as a controversy in court; the judicial side of the physician is developed and likewise what is one of the very greatest assets of the medical profession, the ability to properly evaluate symptoms. The conference emphasizes the teaching side of the hospital and this phase is one of vast importance. The younger physician is given an opportunity to learn, and at the same time he is safeguarded from some of the pitfalls that often beset the beginner.

He has an opportunity to become expert in professional work and to develop himself without doing so entirely at the expense of a patient. Professional reading and research study are stimulated. The conference helps its participants to a marked degree to keep abreast of the times and in touch with current thought and practice. I knew of nothing that is more conductive to professional open-mindedness.

While many hospitals are having their staff conferences monthly, I believe it far better that they be held more frequently, either weekly or semi-monthly; professional work and interest are stimulated, the staff members get to know each other better and 'esprit de corps' is developed.

*Read before the Richmond meeting of the Virginia-West Virginia Section of the American College of Surgeons, May, 1924.

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WALTER M. BRICKNER, B.S., M.D., F.A.C.S., *Editor*
New York City

ELMIRA, NEW YORK, APRIL, 1925.

TWO-STAGE AMPUTATION FOR PYARTHROSIS OF THE KNEE

Of much more than passing interest is Blake's excellent article on The Treatment of Acute Pyogenic Joint Infections in this issue of the JOURNAL. With admirable clarity and precision it lays down the guiding principles in the management of acute joint suppuration, according to the infecting organism and according as that infection is direct or through the blood stream. Of especial interest in the article, because here published for the first time, is Blake's two-stage procedure in those septic cases of knee-joint suppuration that require amputation, —the first stage an amputation by simple division through all the soft parts at the level of the joint; the second stage a formal amputation through the thigh after the tissues have been rid of infection.

It was one of the bitter lessons of the recent war that amputation cannot safely be long deferred in these cases of septic suppurative gonitis; and it was also observed that the thigh stump was usually much infected. It was to avoid this latter that Blake evolved the two-stage amputation he has here described. He found it a decided improvement over primary thigh amputation in cases of gunshot wound knee infections, and he tells us that it has proven equally satisfactory in those cases post-bellum in which he has amputated for the same indication.

This preliminary amputation through the knee would appear to closely resemble in principle and purpose the more conservative "Mayo operation" for septic knee suppuration, described by Charles Mayo in 1895. This consists in splitting the joint from side to side across the front, flexing it, and packing the wide open joint with gauze until the infection subsides. The leg is then straightened out; the joint becomes ankylosed but the extremity is thus saved—when the procedure controls the suppuration as planned. Unfortunately, this often does not happen, and the operation has therefore been largely abandoned. It will be seen that the Mayo operation differs from amputation through the joint in that the posterior structures are not divided. And it is therein that the operation fails, for the infected fascial planes of the popliteal region are not drained.

Obviously, Blake's two-stage amputation offers no advantage in those cases of knee-joint suppuration where there is already suppuration above the joint, as in infected compound fractures of the femur. Where, however, the suppuration is in the leg and knee or the knee alone, it would seem to be a wise procedure and we doubt not that it will be promptly accepted into surgical practice.

THE BLOOD COUNT AND THE ICE BAG IN ACUTE ABDOMINAL DISEASE.

We cannot refrain from inveighing again against two practices that are very common if not, indeed, fairly general in the observation of acute abdominal symptoms. First of these is a rush to, and a reliance upon, the "blood count." In determining the question of operation in the so-called "acute abdomen" the leucocyte count is not only an unnecessary procedure in most cases, but is indeed often misleading. The rupture of a gastric or duodenal ulcer may, and often does, take place without producing, at first, a leucocytosis; and the same is true of acute appendicitis and cholecystitis. Indeed, while the white cell count is still low is often the life-saving time to operate; when leucocytosis is established the optimum time has often passed. And yet many a physician withholds consent to operation because the blood count does not point the way, and he sits idly by during precious hours waiting for the leucocytes to multiply! On the other hand, a pronounced leucocytosis may be found in acute abdominal complaints in which operation is not indicated. In the "acute abdomen" clinical signs are all important, and in most cases are quite sufficient by themselves to determine the indication; the blood count may occasionally be helpful in an otherwise doubtful case, but most often it is unnecessary if not actually misguiding.

The second objectionable practice is that of clapping an ice bag upon the belly during the acute stage and before the question of operation has been decided. Despite the lay notion of "freezing out an

pendicitis," learned from the profession, chilling the overlying skin has never cured an attack of appendicitis or cholecystitis, however much it may relieve pain. It does serve, however, to so numb the cutaneous sensitiveness as to mask a very important sign—tenderness. After it is decided that a cholecystitis or an appendicitis will subside without operation, there is no harm done in applying an ice bag, if one wishes to do so; but until the need of operation is definitely determined—no ice bag! During the same period and for the same reason, as far as it is possible humanely to withhold it, also no morphine!

Progress in Surgery

Selections from Recent Literature

The Value of Débridement in Treatment of Burns. A. MURAT WILLIS, Richmond, Va. *The Journal of the A. M. A.*, February 28, 1925.

A form of "débridement" was employed by Willis, in the treatment of a severe burn in a child. A third degree burn involved the median and interior aspect of both thighs, from the junction of the middle and lower third up over the inguinal region on the right, and over the inguinal region and to the anterior superior spine on the left. Under ether, the greater part of this area was cleanly excised with the scalpel, the dissection extending down to the apparently uninjured subcutaneous tissue. A dry dressing was applied. Within six hours the temperature had fallen to normal, and the rate of the pulse had declined to less than 100. Accompanying these changes, there was a striking relief from pain and a distinct improvement in the patient's appearance. A healthy granulating surface soon allowed the application of Thiersch grafts, and the patient was discharged in excellent condition. In burns, as in traumatic shock, there occur, experimentally, an increased concentration of the blood, corpuscular count, and blood nitrogen, while the alkali reserve is not appreciably affected until late in the course of the intoxication. Accompanying these changes in composition of the blood, there is a gradual decline in the blood pressure. In untreated animals, definite structural changes could be detected in the intestine, kidneys and suprarenals. Where excision of the burned areas was practiced, the blood changes were absent or very slight; recovery was much more rapid, and when the animals were killed, there was no evidence of structural damage in the organs mentioned as showing changes in the untreated controls. Up to the present, six cases have been treated by as complete removal of the burned tissue as possible, with recovery in all but one instance.

The Treatment of Congenial Cleft Lip and Palate. ROBERT EMMETT FARR, Minneapolis. *Minnesota Medicine*, March, 1925.

Farr believes that the most important procedure in complete cleft lip and palate is the *early restoration* of the *bony maxillary arch;* that the ideal time for making this restoration is between the third and the eighth week, and that it should always be done before the child is six months old; that the cleft lip should be operated upon before the child begins to talk, or between the fourteenth and eighteenth months.

Lugol's Solution of Iodine in the Treatment of Exophthalmic Goiter. I. A. BIGGER, University, Va. *Virginia Medical Monthly*, March, 1925.

In a series of fifteen cases treated with iodine, fourteen responded satisfactorily: one, reported as showing parenchymatous hyperplasia, did not respond.

The pathological report in eleven of thirteen thyroidectomies was exophthalmic goiter, one was reported as adenoma, and one as degenerating coloid goiter.

Bigger concludes: 1. Iodine is of great value as a preoperative measure in the treatment of exophthalmic goiter.

2. Ligation is necessary in only a small percentage of cases when iodine is used.

3. It is very important to make a differential diagnosis between exophthalmic goiter and adenoma with hyperthyroidism.

4. In doubtful cases, iodine may be used as a diagnostic measure, but only under very careful observation, and frequent basal metabolism determinations.

5. The preoperative period is distinctly shortened by the use of iodine.

6. Operation should be performed as soon as the metabolic rate reaches a base line.

7. We have not used iodine in any case over a sufficiently long period to determine its value as a curative agent.

Congenital Fixation of the Duodenum. WALTER L. NILES, New York. *The American Journal of the Medical Sciences*, March, 1925.

Congenital bands in the abdomen are much more frequent and of greater clinical importance than is generally recognized.

A study of 39 cases of the hepatoduodenal type, which came to operation is reported.

While fully half of this type of cases can be more or less permanently relieved by medical means, the results of operation have been exceedingly satisfactory. Surgery should undoubtedly be utilized in selected cases.

Choleocysto-gastrostomy in Ulcer of the Stomach. (*Über Cholecystogastrostomie bei dem Magenulcus*). DR. NICOLAUS BOGORAS. *Archives fur Klinische Chirurgie*, January 26, 1925.

Bogoras has treated fourteen cases of stomach ulcer by the performance of a choleocysto-gastrostomy. In all of these cases symptomatic relief was immediate; the patient's appetite returned, the pains disappeared, and the acid values of the stomach were much reduced. The choleocysto-gastrostomy is performed in a typical manner, making as wide a stoma in the prepyloric portion of the stomach as possible. The author bases his procedure on the following facts: 1. That 90% of stomach ulcers are found in the prepyloric portion of the stomach along the lesser curvature. This is the region in which the vascular supply is poorest, the glandular mechanism least, and consequently, the resistance of the tissue to peptic digestion minimal. 2 Gastric ulcers are to a large extent associated with hyperchlorhydria. This hyperchlorhydria leads to a relaxation of the gastric musculature and a reflex spasm of the pyloric sphincter. This, in turn, brings about a delayed emptying time of the stomach and a persistance of the influences irritating the ulcer. By performing a choleocysto-gastrostomy, the author purposes: 1. to overcome the hyperacidity by direct alkalinization with bile, and thus bring about a more rapid emptying of the stomach; 2. a mechanical protection of the prepyloric portion of the stomach by the mucin-containing gall.

Functional Tests in Hepatic Disease. CARL H. GREENE, Rochester, Minn. *Minnesota Medicine*, March, 1925.

The test is of clinical usefulness (1) in estimating the amount of bile retention in patients with obstructive jaundice, (2) in giving a quantitative index to the degree of jaundice in the various toxic or infectious types, (3) in following the course of jaundice due to any cause, and (4) in demonstrating the presence of a latent icterus.

Serum bilirubin determinations are most valuable in the differential diagnosis of abdominal colics. After intravenous injection, phenoltetrachlorphthalein is taken up from the blood stream by the liver and excreted in the bile. The technic of the test is simple. The solution of the dye may be obtained in ampules. One cubic centimeter of this solution is injected intravenously for each 22 pounds of body weight. Fifteen minutes are taken, 5 c.c. at each time being ample. The clear serum is separated, a drop of alkali is added to

bring out the color of the dye, and comparison made with standard tubes. Normally the dye is rapidly removed from the blood stream. At the end of fifteen minutes only 5 to 7 per cent remains, while at the end of an hour only traces of dye are present. In patients with obstructive jaundice, as much as 30 per cent of the dye may still be present in the blood stream, two hours after the injection. The dye test is of greatest clinical value in the study of those cases of hepatic disease in which jaundice is not a factor.

In cirrhosis the test shows definite changes, although the correlation of laboratory findings with the clinical picture must be made with care. In biliary, syphilitic, and atrophic cirrhosis, the finding of dye retention has definite diagnostic and prognostic value.

The presence of a normal serum bilirubin and the absence of dye retention will not exclude hepatic disease. Positive tests, on the other hand, are of great value in indicating the probable presence of definite and widespread hepatic disease. Hence, although the present hepatic functional tests are not ideal, their introduction marks another milestone on the road to the better understanding of diseases of the liver.

On Pancreatic Cysts. Max Einhorn, New York. *The American Journal of the Medical Sciences*, March, 1925.

The most prominent symptoms in cases of pancreatic cysts are fulness after meals, gastric distress and vomiting at times. The larger the cyst the more distress is present.

The diagnosis of pancreatic cyst is not difficult, provided the cyst has assumed considerable proportions and the clinician is aware of such a possibility. The features that help to recognize this disease are the following:

1. There is a tumor usually in the left hypochondrium with a smooth even surface, frequently showing fluctuation.

2. The principal protrusion appears to lie in the left nipple line beneath the costal margin. The dulness produced by the mass on percussion does not extend to the spleen on the left side, nor to the liver on the right.

3. Changes in the configuration of the tumor are of frequent occurrence, dependent upon the state of the stomach (whether the latter be filled or empty.)

4. There is a filling defect in the stomach due to pressure from the outside (recognizable by roentgen-rays).

5. Either a very rapid increase in the size of the tumor (within a month or two), or on the other hand a very slow protracted course (several years) is characteristic for a cyst.

In regard to treatment, there is only one course to pursue, and that is to operate as soon as the diagnosis is reasonably made; for without operation the condition usually leads to protracted illness, great suffering, and death. An operation, however, either removal of the cyst or aspiration and drainage after suturing the opened cyst to the abdominal wall—is ordinarily followed by a permanent cure; this occurred in the two cases described.

Appendicitis in 300 Cases of Asthma and Other Forms of Allergy. William Lintz, Brooklyn, N. Y. *New York State Journal of Medicine*, March 6, 1925.

In allergic patients, before diagnosing appendicitis, one has to rule out anaphylaxis as the true etiology, a condition hardly thought of in connection with appendicitis. When there is a continuance of the symptoms for which appendicectomy was done, anaphylaxis should be thought of. Even anaphylactic patients may temporarily be improved following appendicectomy, but this is due rather to the restriction of the allergic food, than to the operation. The change produced in the autonomic nervous system as the result of the operation may also be a factor in the improvement. Even the finding of a pathological appendix in the anaphylactic patients, does not necessarily mean that an operation was justified. A normal appendix, anatomically speaking, is a rarity. These patients very frequently develop all kinds of skin rashes, from obscure causes, before they leave the hospital after their appendicectomy. A tender McBurney point is a very frequent finding and means nothing in these allergic patients, no matter how prominent the gastro-intestinal symptoms and the abdominal tenderness may be. The absence of abdominal rigidity is a constant sign in these cases and contra-indicates operations. No class of cases is operated upon so much. No class of cases is benefited so little by these operations.

Allergy is a distinctly familial and inherited disease. Asthma, hay-fever, allergy of the skin, and gastro-intestinal tract, etc., are in reality not diseases per se; they are only manifestations of the underlying disease called allergy. In patients with indigestion and right-sided abdominal pain, allergy should be ruled out.

Acute Non-Tuberculous Ilio-Psoas Abscess. LeRoy Long, Oklahoma City, Okla. *Southern Medical Journal*, March, 1925.

Long calls attention to a syndrome made up of flexion deformity of the thigh, a tender mass of recent formation on the inner side of outer Poupart's ligament, moderate pain about the inguino-crural region, remittent fever, marked leucocytosis, emaciation and weakness, which is associated with and caused by an acute abscess behind the iliac fascia.

He has operated upon six patients presenting this syndrome during the last few years, which would seem to indicate that the condition is not an extremely infrequent one.

There was permanent recovery in five of the patients in from three to six weeks. The infecting organism was staphylococcus aureus in three cases, staphylococcus albus and streptococcus in one case and streptococcus in one case. In one case there is no record of the organism.

Granuloma Inguinale. Including a Series of Cases Illustrating Some Points in Prognosis and Treatment. A. Reith Fraser, Cape Town, South Africa. *The Journal of Urology*, February, 1925.

Granuloma inguinale is a chronic granulomatous condition affecting the subcutaneous tissues of the pudenda, inguinal regions and perineum. It occurs in tropical, subtropical and temperate latitudes, and is probably a much more common affection than has previously been supposed. The disease is a common one in such temperature latitudes as the United States and South Africa. It is still uncertain what organism is responsible for the lesion. Experimental inoculation in lower animals so far has been unsuccessful.

Eighteen cases of granuloma inguinale are summarized. Of these tartar emetic was employed in 16. Six cases healed completely. In 10 cases there was no benefit from the intravenous use of this drug. In one case tartar emetic was not employed, and in another the condition healed after administration of sulfarsenol. In no case was observed the rapid healing following intravenous tartar emetic reported by some workers.

The prognosis in this condition is always grave as regards prospects of healing. There is no danger to life, and little impairment to general health. Intercurrent disease frequently makes headway on account of lowered resistance on the part of the patient. If the lesion is confined to the penis there is always a serious risk of the whole organ being completely destroyed. When this unfortunate state is reached the disease invariably becomes quiescent, and, although further spread does not occur, complete healing never takes place.

The statement that the disease tends to spontaneous healing is without foundation. There are many attempts at healing, fibrosis and deep cicatrization being characteristic. Complete spontaneous healing, however, never occurs

When antimony therapy is unsuccessful, other plans of treatment are invariably unsatisfactory and seldom attended with success. As a rule the arsenicals have little or no influence on the condition, although in one case sulfarsenol brought about resolution. Mercury, iodides, intramine, colloidal manganese, and sulphur are without value. Such procedures as curettement, cauterization and excision are invariably disappointing, and speedy relapse is the rule. Heliotherapy does not influence the condition.

Pre-renal Anuria. Alexander Randall, Philadelphia. *The Journal of Urology*, March ,1925.

This group depends upon, and divides itself into, a failure of either the blood vascular system or the nervous control system, for in it we recognize a urinary apparatus ready and capable of functioning but where some element in the

body economy outside the urinary system is so deranged that such secretory function does not proceed.

A certain pressure in afferent renal vessels, 60 mm. of mercury, is essential for urinary secretion to take place, and lower figures are accompanied by anuria. Blood pressure, or more accurately, pulse pressure, is a matter of the utmost importance in urologic surgery.

A neurogenic origin exists for some cases of anuria. It has always been considered good surgery to operate on such cases of anuria. Nephrotomy was at first advised; later decapsulation was found sufficient. Surraco has shown that pyelotomy alone is efficacious, and numerous cases are reported where simple catheterization of the ureters has relieved an anuric state. These are cases of true neurogenic anuria and such manipulations have been sufficient to break down the reflex inhibitions to normal function.

In the therapy of this group of pre-renal anurias, prevention is our strongest suit. First of the preventive measures comes the proper sustaining of the necessary blood pressure for the individual case. Secondly, the fluid intake (and alimentary adsorption appears preferable to other modes of administration). Thirdly, the avoidance of, or the removal of, any and all possible factors that may stimulate splanchnic inhibition. Fourthly, care in the administration of renal depressant drugs, especially pituitary extract and opiates.

The anuric state of pre-renal origin, when once established, should be handled by observing all of these factors, and in addition it may be actively combated by three methods of attack: first, the possible value of vesical distention and rapid evacuation, as a stimulant to diuresis; secondly, the known practical value of bilateral ureteral catheterization, which in all probability breaks an inhibitory arc, acting as the cause of the anuria; and, thirdly, the established operation of renal decapsulation.

There is great danger in temporizing with this deceptive condition. One day devoted to the preventive steps above enumerated with stimulation by bladder lavage, followed by twenty-four hours' trial of ureteral catheterization, ought to bring the surgeon, if faced by failure, to the realization that renal decapsulation is imperative.

The Treatment of Pyelitis of Pregnancy with Retention (Indwelling) Ureteral Catheter. Report of a Case. JOHN O. RUSH, Mobile, Ala. *Surgery, Gynecology and Obstetrics,* March, 1925.

Pyelitis and pyelonephritis will respond to drainage as do pus conditions in any other portion of the body, and retention ureteral catheter is the method of choice.

In all cases of pyelitis and pyelonephritis, even in children, the retention ureteral catheter is preferable to other forms of treatment.

Catheter drainage is preferable to lavage with drugs, since the strength of the drug used is insufficient to kill the organism producing the disease. Rush believes that the passage of catheter by its dilatation of the ureter is what benefits the patient in lavage and not the drug used and sterile water will produce as good results in lavage as nitrate of silver.

No surgical procedure should ever be resorted to until catheter drainage has been given a most thorough trial.

The finest quality imported *x*-ray catheter should be selected for this work. Rush never found any urinary deposits on this type of catheter, even after it has remained in the ureter 26 days.

The technic is described.

Torsion of the Pedicle of Ovarian Cysts. FRANK HELVESTINE, JR., Charlottesville, Va. *American Journal of Obstetrics and Gynecology,* February, 1925.

In a series of eighteen cases the ages of the patients ranged between ten and sixty-four. In thirteen, or 72.2%, torsion occurred on the right side.

The degree of torsion varied from one to four complete turns of the pedicle. All stages of degeneration of the tumors were found, from intense congestion, which was relieved when the torsion was reduced, to complete gangrene. Hemorrhage had taken place into the cystic cavities of some of the tumors. Free fluid was found in the peritoneal cavity in seven of the cases. The clinical picture of a typical attack of torsion is somewhat as follows: The patient, usually a multipara, is seized with severe pain, of a variable character, in the right or left ovarian regions, according to the side from which the tumor originates. Pain is followed shortly by nausea and vomiting. There is a history of previous attacks. The patient appears to be ill and in considerable pain. The lower abdomen is distended and at the site of the pain there is tenderness and rigidity. A mass, tender and semifluctuant, can be outlined which extends into the pelvis and can be distinguished from the body of the uterus and palpated in one of the lateral fornices. Temperature 100 degrees F.; leucocytes 10,000. Urine negative.

Treatment is by immediate operation, although the patient will usually recover from the attack without interference. However, attacks recur and serious complications may take place. The prognosis in cases treated by operation is good even though a complicating pregnancy be present.

Unusual Complication Following Usual Operative Procedure for Varicose Veins. DAVID FISHER and EDMUND H. MENSING, Milwaukee. *The Journal of the A. M. A.,* March 7, 1925.

Two cases are cited that emphasize the extreme importance of a careful investigation in so self-evident a condition as varicose veins. In one of the cases the man had been advised to have an operation for varicose veins before an ulcer developed. The physical examination was negative except for the extremities, which showed marked prominence and slight bulging of all the superficial veins, extending from both feet upward to a point about 8 cm. above Poupart's ligament. There was very little tortuosity. The leg was raised and drained of its blood; then contriction was applied to the saphenous opening, and the leg lowered. Even after ten minutes, the veins did not show any filling. This, of course, meant that the deep or perforating veins was thrombosed or varicosed. In view of a history of typhoid, it was safe to assume that in this case the deep or perforating veins were thrombosed, preventing the filling of the superficial veins. Had this man been operated on, gangrene of the extremities would probably have resulted. In the second case an ill advised operation was followed by gangrene necessitating a midthigh amputation. An entire extremity was sacrificed, not to mention the physical suffering in the interim, because of the failure in the first place to apply a very simple test to the circulation. The authors urge that in every case of varicose veins, the Trendelenburg test be applied to ascertain the condition of both the superficial and deep veins; and in case of doubt, when the collateral circulation extends above Poupart's ligament, and no intra-abdominal cause for venous obstruction exists, the deep veins should be suspected.

The Operative Treatment of Varicose Ulcer. JOHN HOMANS, Boston. *The Boston Medical and Surgical Journal,* February 26, 1925.

Treatment of post-phlebitic ulcer: The patient is kept in bed until the maximum improvement in the inflammatory reaction appears to have been obtained. It is not necessary that the ulcer should have healed during this period which may extend over one to three weeks. The great saphenous vein is then removed down to the upper limit of the ulcerated area. Should the dissection of the upper calf be carried into indurated tissue, great care must be used in handling and closing the incision. This part of the operation is to be completed before anything further is done. The area of ulceration, including any thin, bluish, recently healed skin about it, may now profitably be excised, taking with it in one mass the veins and deep fascia behind. This excision disregards altogether the possibility of exposing bone, tendon-sheath and muscle. It is surprising how unchanged the tissues behind the deep fascia appear, and it is important that the loose tissue immediately beneath the deep fascia should be preserved. All bleeding points are tied or stopped by compression. The exposed area may then be covered with a Thiersch graft. This graft is likely to be successful if the ulcer and parts beneath it have been cleanly excised in one block so that the freshly exposed tissues are unsoiled and their surface dry. Should the reverse be the

case, the area may be treated with Dakin's solution or other antiseptic dressings until it has granulated, when a delayed graft is made.

This treatment will cure many cases but the patient should be told that more may be required. The leg may appear soundly healed, and yet, when the patient resumes an active life, breaking down the tissue about the graft, but rarely of the graft itself, may occur. In that case removal of more tissue is indicated and it is here that excision of strips of deep fascia, above, below and beside the grafted area may be undertaken.

Most ulcers dependent upon simple varix are healed by rationally complete removal of the great saphenous system of veins. Ulcers of a post-phlebitic sort must be excised as if they were malignant tumors, and, in addition, an attempt should be made, when the indications suggest the necessity of it, to restore lymphatic drainage in the superficial tissues of the leg.

Splanchnic Anesthesia: An Analysis of Forty-Two Cases. WILLIAM R. MEEKER, Rochester, Minn. *Archives of Surgery*, March, 1925.

Clinical experience with splanchnic anesthesia proves it to be inefficient, since, by its use, a complete surgical anesthesia of the abdominal cavity is not produced. It is the least important of all the factors concerned in the success of an abdominal operation under local anesthesia.

Besides the production of an inadequate intra-abdominal anesthesia, splanchnic nerve block is not free from danger, a fact acknowledged by most users of the method. Four deaths in a collected series of 1,375 operations is a higher mortality than that recorded for spinal anesthesia.

Injuries to Carpal Bones: Fracture of the Scaphoid and Dislocation of the Semilunar. F. F. MCGAULEY, Schenectady, N. Y. *Archives of Surgery*, March, 1925.

All bad sprains or poor results from Colles' fracture should be examined by roentgen ray for carpal injuries. Early diagnosis and treatment, particularly as applied to a dislocated semilunar, result in a useful hand. Late diagnosis, even with treatment, means a markedly impaired member.

The patient should be anesthetized before manipulation of the hand. Manipulation should be done under the fluoroscope whenever possible. In case of late diagnosis, one should not hesitate to remove both parts of the fractured scaphoid, as well as the dislocated semilunar.

Early massage and passive moments, given as soon as the pain and swelling subside, are essential.

Pathological Anatomy of Fractures of the Neck of the Femur. (*Zur pathologischen Anatomie der Schenkelhalsfraktur*) FRITZ HESSE, Dresden. *Archiv. für Klinische Chirurgie*, January 20, 1925.

The author has dissected and carefully examined macroscopically and microscopically six fractures of the neck of the femur at varying intervals up to 14 months following fracture. All showed a partial necrosis of the proximal fragment. The development of these necrotic areas as well as the slight tendency of neck fractures toward healing is to be explained largely on a vascular basis. Fractures of the neck usually involve a solution of continuity of the nutrient vessels which are derived from the circumflex artery. Only when the blood supply is preserved through an incompletely torn periosteal or synovial fold is adequate healing to be expected. The author calls attention to the fact that the neck of the femur is covered largely by synovial membrane and not by periosteum. Thus periosteal callus is not to be expected and the endosteal callus formation is markedly disturbed by the interruption of the vascular supply. In explaining pseudarthrosis attention is further called to the frequent interposition of the torn edges of the capsule and the lytic effect of the synovial fluid in preventing callus formation.

Subcutaneous Injuries to Tendons. (*Ein Beitrag zur Kasuistik subkutaner Sehnenverletzungen*). W. STEIGER, Wieden. *Wiener Klinische Wochenschrift*, February 5, 1925.

The author reports on two cases of trauma to the first interphalangeal joint, resulting in complete loss of extension. There is a history of direct trauma with the immediate appearance of a fusiform swelling on either side of the joint giving somewhat the picture of a spina ventosa. Roentgenologically, there is to be seen no injury either to bone or joint and at operation, these fusiform swelling are found to be the lateral expansions of the extensor tendon, displaced to either side of the joint. There is no injury to the joint capsule and the only treatment necessary is a replacement of the dislocated tendons. A few sutures are placed holding the tendons fragments to one another. The functional results are excellent.

Book Reviews

Dislocations and Joint-Fractures. By FREDERICK J. COTTON, A.M., M.D., F.A.C.S.; Visiting Surgeon to the Boston City Hospital; Consulting Surgeon to the N. E. Hospital for Women and Children, and to the Beth Israel Hospital and to the Peterborough Hospital; Consultant in Surgery to the Veterans Bureau; Associate in Surgery, Harvard Medical School. *Second Edition, Reset.* Octavo; 754 pages; 1393 illustrations. Philadelphia and London: W. B. SAUNDERS COMPANY, 1924.

Fourteen years have elapsed since the first appearance of Cotton's splendid work. Those years have been important developments in the treatment of fractures and compound joint injuries, evolved largely from experiences with the management of gunshot wounds of the bones and joints in the war, but also from a certain measure of specialism and an intensive study of fracture treatment methods and analyses of end-results. The principles and the practices concerned in those developments are largely incorporated in this second edition, which remains, however, like the first, a distinctively personal work. It is an exposition of the author's vast personal experience, and not an encyclopedic treatise; an eminently practical work, and not a mere bibliographic study. Even the new chapters dealing with the disinfection and closure of joints, the fixation of infected compound fractures, etc., are based chiefly on the author's own military hospital work. As before, the illustrations are all original, and—except the roentgenograms and photographs—are drawn by the author. About 200 have been added.

The book is more nearly a complete work on dislocation and fracture than its title indicates. It includes not merely joint fractures but also juxta-articular fractures (e. g., Colles', malleolar, os calcis fractures), fractures of metacarpals and metatarsals, of vertebrae, sternum, ribs—indeed, practically all fractures except those of the skull and the shafts of the long bones.

Diseases of the Rectum and Pelvic Colon. By MARTIN L. BODKIN, M.D., F.A.C.S., Rectal Surgeon, St. Catherine's Hospital; Associated Surgeon, Broad Street Hospital; Late Consulting Rectal Surgeon, Zion Hospital; Late Diagnostician of Rectal Diseases, Brooklyn Diagnostic Institute; Late Rectal Surgeon, Bushwick Hospital; Williamsburg Hospital, St. Mary's Hospital, and Howard Orphan Asylum; New York. *Second Edition.* Octavo; 487 pages; illustrated. New York: E. B. TREAT AND COMPANY, 1925.

From a very extensive experience in the treatment of rectal diseases, the author has compiled a volume that is comprehensive in its scope as well as terse in its presentation. The indications for treatment as well as the various medical and surgical procedures are fully and lucidly described. Several new chapters on the use of colonic irrigation and on the relation of the bacteriology of the intestinal tract to the different disease forms are added. In discussing this latter problem, the author correlates the findings of many workers in the field of intestinal bacteriology and points out the significance of controlling the flora of the intestine by appropriate modifications of diet. While he may be carrying his point too far, his contention that prognosis in disease of the intestinal tract, e. g., in appendicitis, may be determined by diet and its consequent influence on the intestinal flora, is interesting and even stimulating.

Handbook of Operative Surgery. By SIR WILLIAM IRELAND DE C. WHEELER, (MOD.) B.A., M.D. (DUB. UNIV.), F.R.C.S.I., F.A.C.S., (HON.); Surgeon to Mercer's Hospital and the National Children's Hospital, Dublin; Past President, Royal College of Surgeons, Ireland; Consulting Surgeon to the Ministry of Pensions Hospital, Blackrock; Late Lieut.-Col. R. A. M.C. *Fourth Edition.* Octavo; 441 pages; 298 illustrations. New York: WILLIAM WOOD AND COMPANY, 1925.

This little volume appearing now in its fourth edition has passed through many vicissitudes in its career. Presented as a handbook for students and internes, it served as a text-book of operative surgery to the improperly prepared surgeons whom the exigencies of war burdened with unexpected responsibilities. Unfortunately, the author has not completely recovered from the upset which his surgical point-of-view suffered during the war. The consequence is that in his work fully one third is devoted to a consideration of ligatures of arteries and amputations to the great detriment of the various other surgical procedures more commonly employed in civil practise. In fact, apart from the procedures above indicated, the treatment of the surgery of the organs of the body is very sketchy and unsatisfactory.

A Surgical Pilgrim's Progress. Reminiscences of LEWIS STEVEN PILCHER. Large octavo; 451 pages; illustrated Philadelphia and London: J. B. LIPPINCOTT COMPANY, 1925.

In the January issue of the JOURNAL we referred editorially to the appearance of these "Reminiscences" of Dr. Pilcher, now 80 years old, simultaneously with the publication of the "Commemorative Issue" of *Annals of Surgery*, which marked the fortieth anniversary of his editorship of that great surgical journal.

A Surgical Pilgrim's Progress is a charmingly written an interesting account of a long life well lived of accomplishments in patriotic service, in surgery, in medical literature. It is, too, a story of the developments of modern surgery, to which Pilcher contributed so large a share, both as surgeon and as editor.

A Compend of Genito-Urinary Diseases and Syphilis. By CHARLES S. HIRSCH, M.D., Urologist to the Jewish Hospital, Philadelphia. *Fourth Edition.* Duodecimo; 320 pages; 44 illustrations. Philadelphia: P. BLAKISTON'S SON & Co., 1925.

This little compend, one of a series presented by the same publishing house, is well written and concise. Apart from some slight changes, the fourth edition contains nothing of special import. The whole of the chapter on neuro-syphilis and its treatment has been rewritten.

The Challenge of Childhood. Studies in Personality and Behavior. By IRA S. WILE, M.S., M.D.; Assistant Pediatrician and Director of the Health Class, Mt. Sinai Hospital, N. Y.; Vice-President, Children's Welfare Federation of New York; Member of the National Committee for Mental Hygiene; Former Commissioner of Education, New York City. Octavo; 305 pages. New York: THOMAS SELTZER, 1925.

With rare insight, Dr. Wile accepts the challenge of childhood, and in an all too small a series of masterly pen pictures, he gives to doctors and laymen a succinct account of adjustment problems in children.

Dr. Wile, who for ten years couducted the Surgical Sociology department of this JOURNAL, speaks with the weight of authority. His cases are well selected from a wealth of experience obtained in many and varied clinical and educational contacts.

The cases described and discussed, fifty in number, are divided into four groups representing, respectively, Physical, Intellectual, Emotional and Social Problems. They make extremely interesting reading and illustrate how much can be accomplished in adjusting the abnormal and the unusual child by the methods the author here unfolds—adjustments as often of family as of the child itself.

This book will prove helpful to physicians and surgeons, in guiding parents with their problems, and is one which they may place confidently in the hands of teachers, and parents. It is a sane and balanced treatment of a subject frequently given over to enthusiastic faddists! A real service to the oncoming generation is rendered by this therapeutic and prophylactic presentation of the adolescent problems met with in our present changing social conditions.

Diseases of the Heart: By DR. HENRI VAQUEZ, Professor of the Faculty of Medicine of Paris; Physician to l'Hôpital de la Pitié; Member of the Academy of Medicine (Paris). Translated and edited by GEORGE R. LAIDLAW, M.D., Associate Physician to the Fifth Avenue Hospital, New York City. Introduction by WILLIAM S. THAYER, M.D., F.R.C.P.I. (Hon.), Professor Emeritus of Medicine, Johns Hopkins University, Baltimore. Octavo; 743 pages; illustrated. Philadelphia and London: W. B. SAUNDERS COMPANY, 1924.

The mechanics of cardiac disease make some of its problems matters of peculiar surgical interest. Vaquez, the foremost French authority on cardiac disease, is an observer of rare insight who portrays from an extensive clinical experience, a very broad acquaintance with the work of others in his field, and by a style that is charming in its simplicity and directness, the current Gallic viewpoint concerning diseases of the heart.

This book can be recommended for its balance as well as for its completeness. Excellent bibliographies are appended to each chapter. It is a source of delight to praise the excellent English translation of Dr. Laidlaw, who has rendered the classical language of the author into elegant English without, as so frequently happens, losing the flavor of the original.

The introduction by Thayer is a succinct account of the history of our knowledge of cardiac disease. In expression and content, it will rank close to the famous introduction to Trousseau's "Clinical Medicine".

A Text-Book of Physiology. By H. E. ROAF, M. D., Toronto, D.Sc. Liverpool, M.R.C.S., L.R.C.P.; Professor of Physiology at the London Hospital Medical College, University of London. Octavo; 605 pages; illustrated. New York: LONGMANS, GREEN AND COMPANY, 1924.

Shortly after his graduation from medical college, the reviewer resolved to read annually some work on physiology in order to keep posted in that essential discipline. For a number of years, Michael Foster's "Textbook of Physiology" was reread. Gradually the viewpoints have so changed that even that famous work became antiquated. The numerous workers in this field accumulated so many facts from research, that the field was left without a unifying view. To place achievement in its proper perspection requires skill.

Roaf has furnished in an excellent new text-book on Physiology, a balanced, conservative, and readily understandable account of modern and older researches in physiology, so that it may be placed with confidence in the hands of students and practitioners interested in these problems.

The book is divided into four parts,—mechanical, chemical, regulative, and maintenance of the individual and reproduction of the species. This is an excellent method of presentation, and affords an opportunity to present physiology from a fresh standpoint. The text reveals the authority of an accomplished teacher. The book is a complete presentation of current views; well balanced, succinct, and authoritative.

The Action and Uses in Medicine of Digitalis and Its Allies. By ARTHUR R. CUSHNY, M.A., M.D., LL.D., F.R.S., Professor of Pharmacology in the University of Edinburgh. Formerly in the University of London, University College, and in the University of Michigan, U. S. A. Octavo; 308 pages; illustrated. New York and London: LONGMANS, GREEN AND COMPANY, 1925.

The monograph by Cushny enhances his reputation as a teacher and scholar. This volume sets forth our accumulated knowledge of the pharmacology and therapeutics of digitalis, and covers a wider field than the excellent monograph by Canby Robinson on the therapeutics of digitalis published in Volume 1, No. 1 of *Medicine*. His host of American friends and admirers will find this new fruit of Professor Cushny's pen an inspiring contribution.